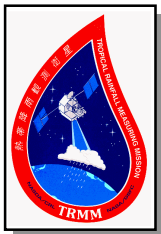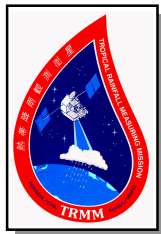# TRMM Flight Operations Monthly Status Review (MSR)

January 31st, 2001
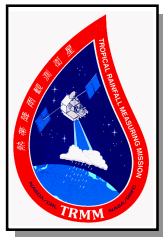
FOT Overview

- Operations Status
  - Flight Ops Summary - Lou Kurzmiller
  - Electrical & Thermal - Andy Calloway
  - ACS & FDS / C&DH - Mark Fioravanti
  - RCS & RF / Comm - David Corley
  - Power & Deployables - Justin Knavel
  - LIS - Justin Knavel
  - CERES & VIRS - Mark Fioravanti
  - TMI - David Corley
  - PR - Andy Calloway
  - Ground System - Dan Palya
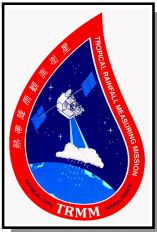 - Upcoming Activities - Andy Calloway

Flight Operations Summary

- Supported 554 SN events in January

  – 1 Yaw Maneuver

  – 8 Delta-V Maneuvers

- 2 Event Rpts; 2 Generic Late Acq Rpts generated

  – ER #223 MOC Prime String: Hung up, Re-boot required

  – ER #224 MOC W/S: Hard drive failure

- 1 EPV continuity failure; monthly TDE & TDS

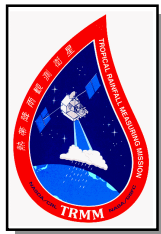# Flight Operations Summary

- Notable Events

  - Established test/training facility in B-14

    » Successfully commanded s/c on 25 Jan 01

  - Weathered B-32 power maint work (UPS 1 & 2)

  - Continued development of TRMM Flight Operations website
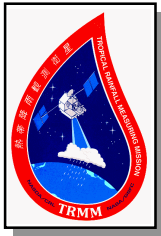
Flight Ops Summary

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTALS
SPECIAL SPACECRAFT EVENTS AND ACTIVITIES FOR TRMM 2001												
2	8												8
2a	1												1
2b	0												0
2c	0												0
3	1												1
3a	1												1
3b	3												3
3c	1												1
3d	0												0
3e	1												1
3f	2												2
4	3												3
4a	0												0
4b	1												1
4c	0												0
4d	5												5
4e	0												0
5	3												3
5a	0												0
5b	0												0
5c	0												0
TOT:	30	0	0	0	0	0	0	0	0	0	0	0	30

LEGEND

STANDARD CATEGORIES	TRMM-SPECIFIC SUB-CATEGORIES AND EXAMPLES
1 Targets of Opportunity	N/A
2 S/C Maneuvers	DeltaVs **(2)** , 180° Yaw Maneuvers **(2a)** , 90° Yaws **(2b)** , Deep Space Cals **(2c)**
3 Unplanned Commanding	Blind Acqs **(3)** , Patch Loads **(3a)** , Manual DS Ops due to Blind Acqs, MI, etc. **(3b)** , EPVs Fail **(3c)** , VIRS Reset Ops **(3d)** , Anomaly Recoveries **(3e)** , Generic Late Acqs - GCMRs / DS Ops **(3f)**
4 Customer Requests	PR **(4)** , VIRS **(4a)** , LIS **(4b)** , CERES **(4c)** , FSW **(4d)** , AETD **(4e)**
5 Ops due to Celestial Phenomena	UTCF / FS Ops **(5)** , Power Ops - Autospru, TSMs, C/D **(5a)** , Xpdr Offset Ops **(5b)** , Leonids **(5c)**
6 Pre-Launch Testing	N/A
7 L&IOC Operations	N/A
8 EOL Operations	Delta-H Firings **(8)** , Reentry Maneuvers **(8a)**

NOTE: This Record Documents S/C Activities and Does Not Include Other Special Activities Such as Ground System Testing, Simulations, Trending, or New Database, Script, Code, or Procedure Development...
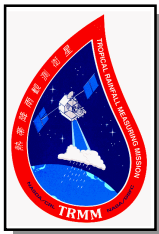
Thermal / Electrical Subsystems

- Thermal and Electrical subsystems remain nominal with no open issues

- FOT will assist AETD as needed for End Of Life Thermal Analysis
  - Kim Brown has been contacted via e-mail for potential analysis:
    - » What is lowest attainable perigee which still meets thermal survivability constraints
    - » What are the thermal constraints, if any, of long duration burns with respect to non-thruster spacecraft components
    - » What is the better direction of flight thermally for end of life

- Safe methods which can heat the fuel and pressurant tanks will be researched (op/surv heaters) to help extend mission life and improve efficiency at EOL
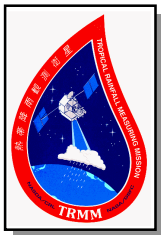
- No relay or other Electrical issues at this time

ACS Subsystem

- Planned Update for ACS tables for off-pointing the Solar Arrays

  - Contingency in case of extended PPT operations are ever needed.
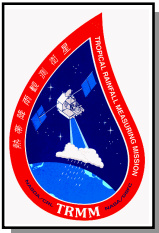
ACS Subsystem

- Open CCRs (In order of Priority);

  – CCR #069: New table 85 to match new TDRS-8 continuity limits for other TDRS, and another table 85 to widen the limits after an update failure.

  – CCR #070: New version of Table 61 to incrementally pitch the S/C while in Sun Acq, if Solar Array fails.

  – CCR #005: Correction for Magnetic Field Epoch, will be required for EOL if apogee is greater than 400 km.

  – CCR #065: Update ACS system tables in preparation for EOL activities.

    » Table #73 (Thruster Parameters)

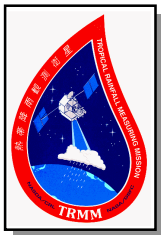   » Table #90 (Mode Configuration Data for Contingency)

  – CCR #053: ACS FS/W bug

FDS/C&DH Subsystems

- UTCF Status;

  – Three Adjustments were performed: one on 01-006 (January 6th), and the second on 01-016 (January 16th), and the third on 01-026 (January 26th)

  – Current UTCF value is 31535996.830040 sec

  – FS Adjust performed on 01-026 (January 26th), new value is x'7BA'

- STO (Spacecraft Telemetry Output) Dropouts

  – Resulting from band-width problem on 1/4 k events (i.e. Too many packets are begin generated for the STO subsystem to output them, and some are being dropped)

  – Corrective action is planned, by reducing the packet rates of CERES and the PSIB-A/B during low rate events.

  – Will not be an Issue if either of the PSIBs or CERES are powered off.
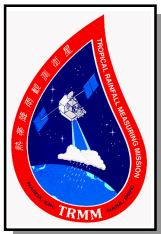
FDS/C&DH Subsystems

- Open CCRs;

  - CCR #034: Writing from RAM to EEPROM for new TSM table #21 and RTSs # 2, 3, 13, 14, and 15. Completed, only need final documentation.

  - CCR #047: Will work with FSW on no-clock software patch activities

  - CCR #048: New on-board DS filter table to record ACE 8-Hz data

  - CCR #071: Build a new DS quota table (73) to reallocate CERES science memory to other instruments, contingent on powering CERES off permanently.

  - CCR #074/075: New RTS #21 and TSM Table #21 were written from RAM to EEPROM 01-026 (January, 18th)

  - CCR #077: Create a TSM to monitor the bus voltage in case of a PSIB telemetry failure.
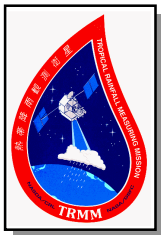
RCS Subsystem

- RCS performed 8 successful Delta-V maneuvers (#264 - #271)

  – Current fuel remaining is 465.011 kg

- Fuel budget meetings have been held discussing fuel needed for re-entry and when blowdown mode will occur. Preliminary EOL estimates from those meetings put re-entry around **July, 2002.**

- No Open RCS Anomaly or Event Reports

- Upcoming Events

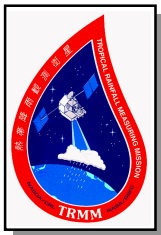 – Begin review of, and training in, Delta-H procedures and scripts for EOL

RF Subsystem

- 2 Generic Late Acquisitions (#80-81)

  - 007/1944z TDW event: Locked up @ 194534. One fwd reacq was sent. All data recovered.

  - 026/2101z T171 event: Locked up @ 210254. One fwd reacq was sent. All data recovered.

- Frequency offsets (monthly average)

  - Transponder #1 = +688.575 Hz

  - Transponder #2 = -901.242 Hz

- No RF Event Reports or MOCRS this month

- Upcoming Events

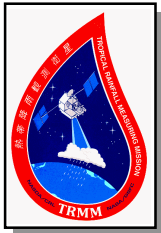 - Offset of transponder 2 frequency likely within 2 months

Power Subsystem

- The new pseudo mnemonics for Essential Bus Voltage and Non-Essential Bus Current are now being trended.
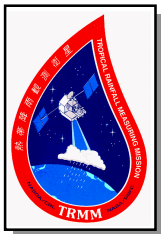
- No other open issues.

Deployables Subsystem

- Anomaly #85 - Solar Array Commanded & Sensed Position Spike

  - Investigation

    » Initiated by a bad GSACE packet

    » Confirmed that solar array was not stuck

    » Further investigation with simulator to determine ACS reaction to bad GSACE packet

- Solar array drives and HGA continue to operate nominally.
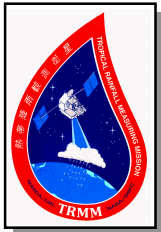
- No other open issues.

LIS Instrument

- Routine MSFC real-time command request performed on 01-019 (January 19th) to reduce packet sequence errors
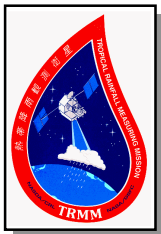
- No open issues

CERES Instrument

- No change in CERES' status.

  – No Science collection because of DAP failure

  – LaRC may wish to perform gimbal tests and then power Off the instrument.

- Open Issues

  – Data Acquisition Processor (DAP) Telemetry Drop Out and Possible Failure (Anomaly #81)

- Issues on Hiatus

  – Continuous Biaxial operations

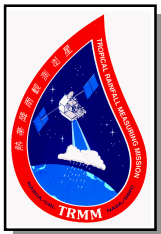 – DR on MP ground system to incorporate new CERES requirements

VIRS Instrument

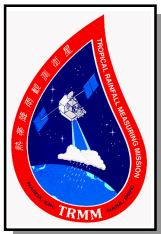- No VIRS Solar Calibrations were performed in Jan 2001.

PR / TMI Instruments

- PR External Calibrations were performed on 1/16, 1/17, and 1/18 for beams 69, 68, and 59 respectively

- PR Open Issues

  - PR Frequency Agreement has expired and will not be renewed

    » No new PR interference was reported by NASDA in January

  - Licensing issues still need to be addressed

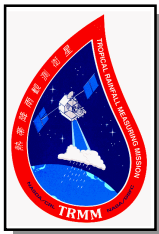- No Open Issues with the TMI instrument

Ground System

- The backup test and command string in Building 14's SOTA Bay-7 has been deemed operational for emergencies, after forward link capability was successfully tested last month. Full Mission Planning scheduling and load-building capability still need to be verified.

- The Bldg. 32 UPS-5 and UPS-2 reconfiguration work was successfully completed last month with no impact to TRMM science operations.

- The three IP Conversion Devices in the MOC are being upgraded from an OS-2 based system (Programmable Telemetry Processors, PTPs) to a Linux based system (known as Small Conversion Devices, SCDs).

- The hard drive on TR3WS1 was replaced by hardware maintenance on 1/19 in order to prevent a possible failure due to the loud noise it started producing.

Upcoming Activities

- 0-2 Months

  - Award last two Spacecraft Analyst Certificates

  - Complete PSIB-Anomaly investigation and activities

  - Complete Commanded / Sensed Array Position Anomaly investigation

  - Assist MD in completing first draft of TRMM EOL Plan

  - Complete the full Backup Control Center failover implementation

  - Complete OS-2 (PTP) to Linux (SCD) conversion for the IP CDs

  - System Software Release 9.0 Delivery; Start using new FDF Product deliveries which incorporate new TDRS-8 data; Start scheduling TDRS-8

  - Begin to test and validate the new PACOR-A system

  - Transponder-2 AOS Offset Activities

  - Continue to close open CCRs, MOCRs, ERs, ARs, and MSR Action Items

Upcoming Activities

- 2-3 Months

  - Complete testing and training with PSIB alternate telemetry patch

  - Complete testing and training with contingency SA Offset configuration

  - Commence DSN/GN FOT training

  - End Of Life Planning, Testing, and Simulations continue